

P4.19.

Cyanobacterial extracts isolated from lake Balaton –do cholinergic receptors provide the common target for neurotoxic effects?

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In the Balaton Limnological Research Institute (Tihany, Hungary) isolated strains of cyanobacteria from algal blooms in the Balaton region are still continuously maintained in cultured conditions. Extracts of some of these isolates (*Cylindrospermopsis raciborskii* ACT 9505, *C. raciborskii* ACT 9504 and *Anabaena flos-aquae*) were compared with the extracts of other cyanobacterial strains (*Oscillatoria formosa*, PCC 6505, *C. raciborskii* AQS) already confirmed as toxin-producing ones. The acetylcholine responses were tested on identified snail (*Helix*, *Lymnaea*) neurons and the isolated snail (*Helix*) heart in the presence of cholinergic drugs and cyanobacterial extracts. Modulation of both the neuronal and muscular responses by the extracts suggested the effect of (anatoxin-a -like) cholinergic blocker and (anatoxin-a (s)-like) cholinesterase inhibitor components in the cyanobacterial extracts made from Balaton strains (*C. raciborskii*, *Anabaena*). Analytical results, however, did not confirm the presence of the already identified cyanotoxins (anatoxin-a, anatoxin-a(s), cylindrospermopsin, saxitoxin) of the Balaton isolates. Our summarized results, therefore, suggest that some unidentified toxic metabolites are produced by the cyanobacterial strains tested, likely acting on a common target, the cholinergic receptor.

This work was supported by the OTKA grant No. K 63451, the Ministry for National Development and Economy and the Lake Balaton Development Council -2008.